

WHAT IS CLAIMED IS:

1. A control system of a power transmission mechanism, in which a transmission torque capacity between transmission members varies according to a pressure to be applied to said transmission members and, in which the pressure to be applied to said transmission members is controlled on the basis of a slip condition between said transmission members as accompanies the lowering of said pressure, comprising:

pressure lowering means for lowering said pressure by a preset value; and

pressure setting means for setting said pressure, in case the slip between said transmission members is not detected even by lowering said pressure by a preset value with said pressure lowering means, on the basis of the lowered minimum value of said pressure.

2. A control system of a power transmission mechanism according to Claim 1,

wherein said pressure lowering means includes means for lowering a pressure command value stepwise and keeping the pressure command value constant for a preset time period and for outputting a command signal to raise said pressure command value after lapse of a preset time period.

3. A control system of a power transmission mechanism according to Claim 1,

wherein said pressure lowering means includes means for lowering

said pressure stepwise and then with a gentle gradient to a preset value.

4. A control system of a power transmission mechanism according to Claim 1,

5 wherein said pressure lowering means includes means for lowering said pressure with a preset gradient for a preset time period and then raising said pressure.

5. A control system of a power transmission mechanism according to Claim 1, further comprising:

10 pressure re-lowering means for lowering said pressure again, in case the slip between said transmission members is not detected even by lowering said pressure by a preset value by said pressure lowering means, by said preset value from a lower pressure than the pressure before lowered
15 by said preset value.

6. A control system of a power transmission mechanism according to Claim 1, further comprising:

20 another pressure re-lowering means for lowering said pressure again, in case the slip between said transmission members is not detected even by lowering said pressure by a preset value by said pressure lowering means, by more than said preset value from a pressure before lowered by said preset value.

25 7. A control system of a power transmission mechanism according to

Claim 1,

wherein said pressure lowering means includes means for lowering said pressure within a preset time; and

5 further comprising limit pressure detecting means for detecting a limit pressure for causing a slip in said transmission members while said pressure is being lowered by a preset value.

8. A control system of a power transmission mechanism according to Claim 7,

10 wherein said power transmission mechanism includes a continuously variable transmission having a transmission torque capacity varied according to a clamping pressure;

wherein said pressure lowering means includes means for lowering said clamping pressure; and

15 wherein said limit pressure detecting means includes means for detecting a slip limit pressure produced as said clamping pressure lowers.

9. A control system of a power transmission mechanism according to Claim 8, further comprising:

20 slip limit deciding means for deciding the start of said slip on the basis of an estimated value, which is estimated from the gear ratio or gear changing rate before the present instant, and the gear ratio or gear changing rate at the present instant.

25 10. A control system of a power transmission mechanism according to

Claim 9, further comprising:

estimated value calculating means for determining said estimated value by considering a preset time period at the lowering start of said clamping pressure.

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11. A control system of a power transmission mechanism according to Claim 9,

wherein said slip limit deciding means includes means for adopting the estimated value of said gear changing rate as a gear changing rate at an instant just before the present instant.

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12. A control system of a power transmission mechanism according to Claim 9,

wherein said slip limit deciding means includes means for adopting a gear changing rate at an instant within a preset range containing an instant, at which the lowering of said clamping pressure is started, as the estimated value of said gear changing rate.

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13. A control system of a power transmission mechanism according to Claim 8, further comprising:

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learning means for determining a learned value of said clamping pressure on the basis of said slip limit pressure;

comparison means for comparing the actual gear ratio after lapse of a preset time period from when said clamping pressure was set and an estimated gear ratio on the basis of said learned value; and

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learned value unadopting means for not using said learned value for the clamping pressure control in case the value of the comparison result between the actual gear ratio and the estimated gear ratio at said comparison means is outside of a preset range.

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14. A control system of a power transmission mechanism according to Claim 8, further comprising:

end deciding means for deciding the end of the detection control of said slip limit pressure on the basis of a gear change command value or a gear changing rate before the slip limit detection and a gear ratio at the slip limit pressure detection time.

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15. A control system of a power transmission mechanism according to Claim 1, further comprising:

pressure applying means for setting said pressure to be applied to said power transmission mechanism, with physical quantities determined from the slip starting pressure, at which the slip between said transmission members is started by lowering said pressure with a preset input torque acting, and a theoretical pressure determined on the basis of said input torque.

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16. A control system of a power transmission mechanism according to Claim 15, further comprising:

learning correction means for learning and correcting said physical quantities on the basis of the action state of said power transmission

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mechanism.

17. A control system of a power transmission mechanism according to Claim 16,

5 wherein said power transmission mechanism includes a continuously variable transmission for changing the gear ratio continuously and changing a torque capacity according to the clamping pressure, and

wherein said learning correction means includes means for learning and correcting said physical quantities on the basis of at least any of the
10 input speed, the input torque and the gear ratio of said continuously variable transmission.

18. A control system of a power transmission mechanism according to Claim 16,

15 wherein said power transmission mechanism includes a continuously variable transmission for changing the gear ratio continuously and changing a torque capacity according to the clamping pressure, and

wherein said learning correction means includes means for learning and correcting said physical quantities on the basis of the function of the
20 gear ratio of said continuously variable transmission.

19. A control system of a power transmission mechanism according to Claim 18,

wherein said learning correction means includes means for learning
25 and correcting said physical quantities by operating the changes in the

friction coefficient in said continuously variable transmission as a function of said gear ratio.

20. A control system of a power transmission mechanism, in which a
5 transmission torque capacity between transmission members varies according to a pressure to be applied to said transmission members, and in which the pressure to be applied to said transmission members is controlled on the basis of a slip condition between said transmission members as accompanies the lowering of said pressure, comprising:

10 a pressure lowering device for lowering said pressure by a preset value; and

a pressure setter for setting said pressure, in case the slip between said transmission members is not detected even by lowering said pressure by a preset value by said pressure lowering device, on the basis of the
15 lowered minimum value of the pressure.

21. A control system of a power transmission mechanism, in which a
transmission torque capacity between transmission members varies according to a pressure to be applied to said transmission members, and in
20 which the pressure to be applied to said transmission members is controlled on the basis of a slip condition between said transmission members as accompanies the lowering of said pressure, comprising:

pressure lowering control means for lowering said pressure stepwise and then with a gentle gradient when said pressure is to be lowered so as to
25 change the slip state between said transmission members.

22. A control system of a power transmission mechanism, in which a transmission torque capacity between transmission members varies according to a pressure to be applied to said transmission members, and in
5 which the pressure to be applied to said transmission members is controlled on the basis of a slip condition between said transmission members as accompanies the lowering of said pressure, comprising:

slip detecting means for detecting the slip between said transmission members as said pressure lowers; and

10 pressure raising means for instructing to raise the pressure to be applied to said transmission members, in case the slip between said transmission members is detected by said slip detecting means, stepwise to a pressure higher than the pressure at the instant of starting said pressure lowering.

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23. A control system of a power transmission mechanism connected to the output side of a prime mover and having a transmission torque capacity varied according to a pressure to be applied to transmission members, in which the pressure to be applied to said transmission members is controlled
20 on the basis of a slip condition between said transmission members as accompanies the lowering of said pressure, comprising:

slip detecting means for detecting a slip between said transmission members, as accompanies the lowering of said pressure;

pressure restoring means for instructing to raise said pressure
25 stepwise in case the slip between said transmission members is detected by

said slip detecting means; and

torque limiting means for limiting the increase in the torque of said prime mover when said pressure is instructed to rise by said pressure restoring means.

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24. A control system of a power transmission mechanism connected in tandem to a clutch having a variable transmission torque capacity, in which the pressure to be applied to said transmission members is controlled on the basis of a slip condition between said transmission members as
10 accompanies the lowering of said pressure, comprising:

slip control means for setting a state, in which a slip occurs in said clutch at a disturbance time with respect to said power transmission mechanism before said pressure is lowered to detect the slip between said transmission members.

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25. A control system of a power transmission mechanism, in which a transmission torque capacity between transmission members varies according to a pressure to be applied to said transmission members, and in which the pressure to be applied to said transmission members is controlled
20 on the basis of a slip condition between said transmission members as accompanies the lowering of said pressure, comprising:

pressure lowering means for lowering said pressure by a preset value; and

pressure re-lowering means for lowering the pressure again, in case
25 the slip between said transmission members is not detected even by

lowering said pressure by a preset value by said pressure lowering means, by said preset value from a lower pressure than the pressure before lowered by said preset value.

5 26. A control system of a power transmission mechanism, in which a transmission torque capacity between transmission members varies according to a pressure to be applied to said transmission members, and in which the pressure to be applied to said transmission members is controlled on the basis of a slip condition between said transmission members as
10 accompanies the lowering of said pressure, comprising:

pressure lowering means for lowering said pressure by a preset value; and

another pressure re-lowering means for lowering said pressure, in case the slip between said transmission members is not detected even by
15 lowering said pressure by a preset value by said pressure lowering means, by more than said preset value from the pressure before lowered by said preset value.

27. A control system of a power transmission mechanism, in which a
20 transmission torque capacity between transmission members varies according to a pressure to be applied to said transmission members, and in which the pressure to be applied to said transmission members is controlled on the basis of a slip condition between said transmission members as accompanies the lowering of said pressure, comprising:

25 slip detecting means for detecting a slip between said transmission

members, as accompanies the lowering of said pressure; and

slip pressure deciding means for deciding the pressure at an instant before the instant, at which the slip between said transmission members was detected by said slip detecting means, as a slip starting pressure
5 between said transmission members.